The Ulster Medical Journal, Volume 65, No. 1, pp. 84-86, May 1996.

Idiopathic spontaneous pneumoperitoneum – avoiding laparotomy – a case report

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Accepted 16 January 1996

The majority of patients presenting with spontaneous pneumoperitoneum (SP) undergo emergency surgery. It is virtually a conditioned reflex for surgeons, when presented with radiological evidence of free subdiaphragmatic air to proceed to a laparotomy. Laparotomy and general anaesthesia are associated with significant morbidity, therefore it is important to recognise SP and treat it appropriately. It is equally important to be aware of the spectrum of diseases which can present with SP.

We report a case of self-limiting massive idiopathic pneumoperitoneum and discuss the pathophysiology and appropriate techniques for its management.

CASE REPORT. A previously healthy 68 year old woman presented with a five day history of gradually increasing abdominal distension, right shoulder tip and epigastric pain. There were no associated gastrointestinal or systemic symptoms. She had been taking non-steroidal anti-inflammatory drugs for three weeks for a groin strain but was otherwise well.

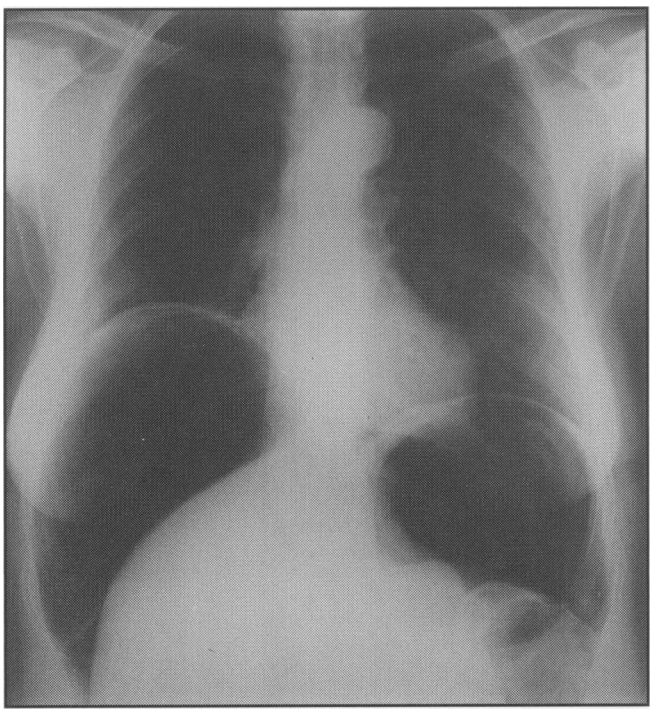

Fig 1. Plain erect abdominal X-ray demonstrating a massive pneumoperitoneum.

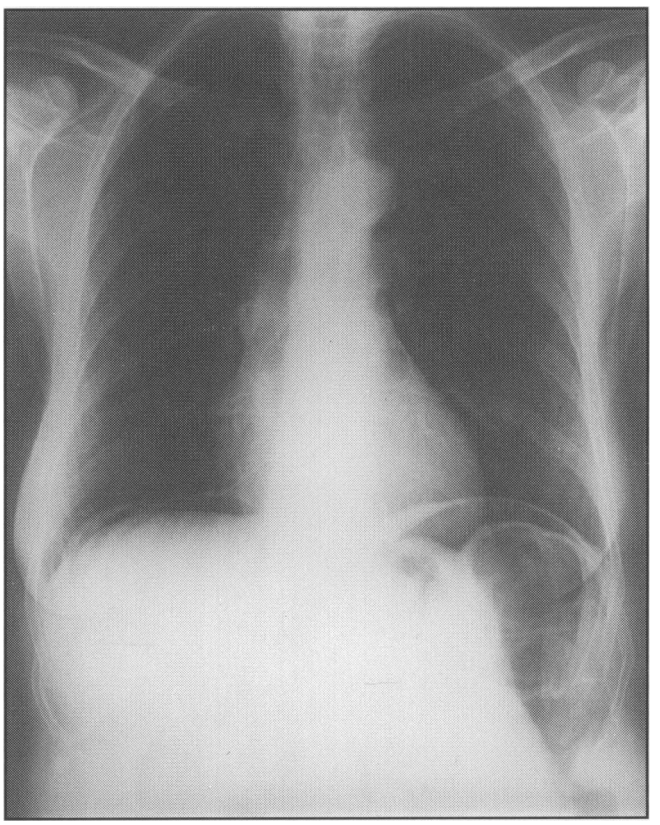

Fig 2. Plain X-ray 6 days later demonstrating spontaneous resorption of the pneumoperitoneum.

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On exanination her abdomen was markedly distended, tympanitic to percussion but not tender. There was no clinical evidence of intestinal obstruction. Plain radiographs of the chest and abdomen revealed a large pneumoperitoneum [Fig 1] and a diagnosis of gastrointestinal perforation was considered. However, in view of her wellbeing she was treated with intravenous fluids and nasogastric suction only. Blood picture and a biochemical screen were within normal limits. Water soluble contrast studies were performed on the upper and lower gastrointestinal tract, both of which were normal. Endoscopy was subsequently performed and this also showed a normal mucosal pattern. Plain x-rays of the abdomen were carried out on alternate days: they demonstrated spontaneous resorption of the intraperitoneal air [Fig 2]. The patient remained well and was discharged home after 10 days.

DISCUSSION

The radiological sign of pneumoperitoneum results from perforation of the gastrointestinal tract in more than 90% of cases.[1] The relevance of this sign was first described by Popper in 1915 and in the following year Dandy demonstrated an association between radiological pneumoperitoneum and a pathological disease state.[2] In 1925 Vaughan and Brams demonstrated free intraperitoneal air in 85% of 29 patients with perforated peptic ulcer disease.[3] Radiographic artefacts may mimic the appearance of free intraperitoneal air and it is important to exclude interposition of the colon between the diaphragm and the right lobe of liver[4] when considering the diagnosis of spontaneous pneumoperitoneum. Chandler et al. were the first to cast doubt on the relevance of this sign when they reported 11 of 29 patients having pneumoperitoneum in the absence of peritonitis.[5] Since then there have been sporadic reports in the literature highlighting various non-surgical conditions which predispose to SP, where laparotomy is unnecessary.[6] Non-surgical causes of SP may be classified according to the source of the gas. Three anatomical sites are recognised:- thoracic, abdominal and the female pelvis. Traumatic pneumothorax, cardiopulmonary resuscitation, mechanical ventilation, chronic obstructive airways disease, *pneumatosis cystoides intestinalis*, jejunal diverticulosis and emphysematous cholecystitis have all been described in association with SP.[7, 8]

In females the natural communication between the fallopian tubes and the peritoneal cavity may predispose to this clinical entity following gynaecological manipulation, pelvic sepsis with gas-forming organisms, post partum exercises or orogenital sexual activity.[9, 10] The condition has also been described following dental extractions and adenotonsillectomy, where no obvious explanation is apparent.[11, 12] Iatrogenic pneumoperitoneum is usually asymptomatic and frequently follows laparotomy. It may be detectable in thin people for up to three weeks following surgery but usually it resolves within 10 days.[13] It may occur after complicated endoscopic procedures and is used routinely in minimal access surgery. It is occasionally employed to distend the abdominal cavity prophylactically prior to repair of large incisional herniae so as to avoid respiratory embarrassment in the postoperative period.

Occasionally, as in this case, the diagnosis is never established and one may only speculate as to the underlying aetiology.[14, 15] A consistent finding of non-surgical pneumoperitoneum is the massive amount of free intraperitoneal gas and the paradoxical absence of other abdominal signs.

In the absence of peritonism or other overt clinical signs, careful observation, regular abdominal examination combined with peritoneal lavage and water soluble contrast studies of the gastrointestinal tract will reduce the incidence of negative laparotomy. Furthermore, a subgroup of patients with other remediable diseases may be identified who require specific investigations and therapeutic strategies.

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